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Fig.1 Fig.2 Fig.3 Fig.4

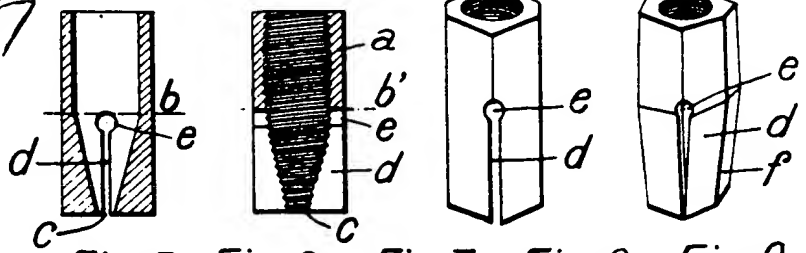


Fig.5 Fig.6 Fig.7 Fig.8 Fig.9

Fig.14 Fig.10 Fig.11

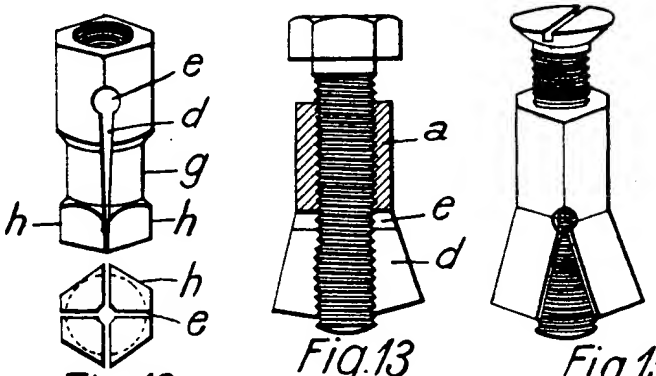
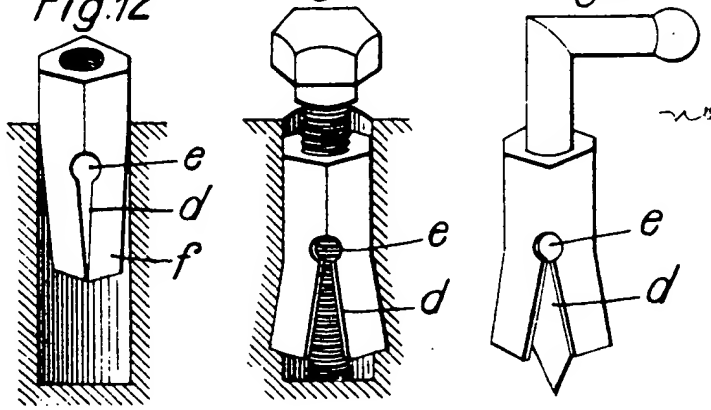


Fig.12 Fig.13 Fig.15



[This Drawing is a reproduction of the Original on a reduced scale]

PATENT SPECIFICATION

Convention Date (France): March 7, 1929.

335,508

Application Date (in United Kingdom): March 7, 1930. No. 7469/30.

Complete Accepted: Sept. 25, 1930.

COMPLETE SPECIFICATION.

Expansible Screw Sockets.

I, RAOUL DIAZ WAGNER, of French Nationality, of 6, rue du Mont-Thabor, Paris, France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The subject of the present invention is an expansible socket of externally polygonal form with sharp edges whereby there may be fixed in any material without sealing and in a manner so as to be removable, screws, bolts or threaded members of any kind, or even nails.

This socket is formed in a single piece of metal or other material pierced with a cylindro-conical bore contracting towards the lower end, and split in the lower portion for part of its height, this bore being formed with a screw-thread of uniform pitch.

It will be seen that in these conditions, when screwing a screw into the socket or in driving a nail thereinto, there is effected the expansion of the prongs constituting the lower part of this socket and thereby the anchorage of the device in the surrounding material.

The annexed drawings show by way of example several embodiments of the invention.

Figs. 1 and 2 show the socket in longitudinal section, respectively before and after the formation of the thread.

Figs. 3 and 4 show the socket in perspective, respectively before and after bringing together the edges of the expansion slots.

Figs. 5 to 9 show several forms of the socket.

Figs. 10 and 11 show, respectively, in longitudinal section and in perspective the screw fully engaged with the socket.

Fig. 12 shows the fitting of the socket in place.

Fig. 13 shows the device when finally in place.

Fig. 14 shows in perspective and in plan a modification of the socket.

Fig. 15 shows the socket used to receive a nail.

As shown in Fig. 1, the female screw *a* is cylindrical for one half of the height of the socket, and conical for the other half, that is to say, gradually diminishing in diameter, without change of the pitch of the thread, starting from the point *b* where the longitudinal slots commence and converging towards the lower end so that the apex of the threaded cone thus formed is at the lower end of the socket.

The external form of the socket is not cylindrical but polygonal with longitudinal sides so as to form a certain number of angles which is essential to prevent in a simple and practical manner rotation of the device in the hole pierced in the plaster, cement or other material when introducing and screwing fully home in the socket the screw or other externally threaded member. The exterior form of the socket may be square or triangular in cross-section, but is preferably pentagonal, heptagonal or hexagonal. Other polygonal forms may be adopted, forming four, five, six or more sharp edges on the exterior of the expansible socket as indicated in plan in Figs. 8 and 9, but the hexagonal form is preferred as ensuring perfectly the object which it is desired to attain, and also because drawn metallic bars of hexagonal form are currently obtainable in commerce, which permits economic manufacture of the device above described.

Longitudinal slots *d* of suitable length, two or more in number, but preferably two in number, are formed in the lower part of the socket in the region of the conical thread.

An eyelet *e* may be pierced across the socket at the point where the slots *d* terminate. This eyelet may be of any form, preferably round, and its diameter should be such as to facilitate without tearing the metal the expansion of the prongs or expansible members at the lower end of the socket when screwing home the screw or other threaded member which in penetrating the conical part of the female cylindro-conical thread in the socket urges outwardly the prongs or expansible members, thus anchoring the device solidly in the plaster or surrounding material as indicated in longitudinal section in Fig. 10 and in elevation in

Fig. 11.

The expansible socket having an angular exterior, and having the form represented in Fig. 3, that is to say, being of the same diameter at both ends, the socket is deformed before fitting by bringing together the lower ends of the prongs until they touch. The amplitude of movement effected in bringing the prongs together is a function of the width of the slots *d* formed as above described, up to about the half or more of the height of the socket.

The lower end *f* of the expansible socket thus becomes slightly pyramidical, which facilitates its penetration by percussion in a hole pierced in the plaster, cement or other material.

The hole for receiving the expansible socket is of suitable form to receive the socket; in every case its diameter, if it is round, should be less than that of the circle in which are inscribed the extremities of the angles of the exterior contour, that is to say, that the diameter of the hole should be slightly less than that of the circle in which are inscribed the sides of the pentagon or of the hexagon or other figure representing the external form of the socket, in order that when the latter is caused to enter the hole as represented in Fig. 12, the sharp edges of the polygonal socket will be embedded in the surrounding material.

It will be understood that in these conditions when the socket as above described has been driven into a round hole the exterior angles of the socket will be forced to enter and become embedded in the surrounding material, preventing the socket from rotation when screwing a screw or other threaded body into the socket.

Immovability of the expansible socket is thus obtained and maintained until the point of the screw or threaded member penetrating the conical portion of the female-thread and therefore of the socket forces apart the prongs or expansible members of the socket and causes them to be anchored in the plaster or other surrounding material.

Another form of the socket is shown in Fig. 14 in which are shown in plan four longitudinal slots *d* instead of two as shown in Fig. 4, which slots naturally determine four prongs adapted to be expanded, starting from the point *e* situated above the mid point of the height of the socket. There is also provided a greater thickness of metal in order to render the device more robust and more appropriate for working with large screws or large bolts in harder material than plaster, such as cement or concrete. There may be formed in the thickness of the metal one or several circular grooves indicated at *g* to form angular projecting parts which form locking lugs indicated at *h*.

When it is desired to fit a socket according to the invention in a wall, a partition, or a floor, first there is pierced, by aid of a boring bit or other suitable tool, as for example an auger, a hole of the desired depth but of a diameter less than that of the socket measured on the angles of its greatest diameter as aforesaid. Into the hole thus suitably prepared the expansible socket is driven by a hammer up to the desired depth.

The extremities of the exterior angles of the expansible socket are firmly embedded by the percussion in the sides of the hole pierced in the wall and the device is secured against rotation as explained above.

Then any suitable member which it is desired to secure to the wall may be fixed in place by screwing into the expansible socket a screw, bolt or screw-threaded member of suitable form.

In the course of this operation the screw is first engaged in the cylindrical portion of the cylindro-conical thread formed in the socket, and finally and progressively in the lower conical split portion of the socket, this part being initially of too small a diameter to receive it. As explained above, the prongs or expansible members separate in the advance of the screw so that when its point has passed slightly beyond the lower end of the socket the bottom portion of the socket is fully expanded and the screw forces into the surrounding material the prongs of the socket, anchoring the device solidly in the wall. The same effect is produced by driving into the socket by percussion a nail of suitable diameter, but the resistance to tearing out of the nail is necessarily less than that of a screw (Fig. 15).

The upper and lower ends of the socket may be modified to receive threaded members of special form or to be fitted in different materials.

In the case where the hardness of certain materials may be too great to permit the socket to expand suitably, the hole first formed in the material may be pierced to mate with the form of the socket in its upper unsplit portion and the sides of the hole at the bottom of the latter may be countersunk, thus forming a free truncated conical space which will be filled by the prongs when expanded.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

An expansible socket of polygonal

exterior for fixing screws or nails or the like in all materials, said socket being formed of a single piece of metal or other material pierced with a cylindro-conical bore contracting towards the lower end and split in the lower portion for part of its height, this bore being formed with a screw-thread of uniform pitch.

Dated this 6th day of March, 1930.

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Agents for the Applicant.

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